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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WEBB, GREGORY E

ART UNIT	PAPER NUMBER
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1751

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/694,747

Applicant(s)

DOYEL ET AL.

Examiner

Gregory E. Webb

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9.19.02</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 19-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Nalewajek (US5856286).

Concerning the dichloroethylene, Nalewajek teaches the following:

20. The composition of claim 17 wherein the hydrofluoroether is an isomeric mixture of methyl nonafluorobutylether and methyl nonafluoroisobutylether

Art Unit: 1751

and 1,2-trans-dichloroethylene.(see claim 20)

Concerning the claimed alkoxy-substituted perfluoro compound and the claimed enhancement agent, Nalewajek teaches the following:

17. The compositions of claims 5, 6, 7, or 8 wherein the hydrofluoroether is a linear hydrofluoroether, a branched hydrofluoroether, or a cyclic hydrofluoroether and wherein the hydrofluoroethers are of the formula $C_{\text{sub}.x} F_{\text{sub}.2x+1} OC_{\text{sub}.m} H_{\text{sub}.2m+1}$ wherein x is at least 2 to 16 and m is at least 1 to 16.(see claim 17)

Concerning the claimed highly fluorinated compound, Nalewajek teaches the following:

11. The composition of claim 9 wherein the halocarbon is an isomer of pentafluoropropane, an isomer of hexafluorobutane, an isomer of pentafluorobutane, an isomer of octafluoropentane, an isomer of heptafluoropentane, an isomer of heptafluorobutane, an isomer of dichlorofluoroethane, an isomer of dichlorotrifluoroethane, or mixtures thereof.(see claim 11)

Concerning the claimed substrate and the claimed optical substrate, Nalewajek teaches the following:

In another embodiment, the invention provides a composition comprising a solvent comprising a halocarbon, a hydrofluoroether, or mixtures thereof and a surfactant of the above formulae wherein the components are present in amounts sufficient to provide effective drying or dry cleaning. The solvent-surfactant compositions of the invention effectively displace

Art Unit: 1751

water from a broad range of substrates including, without limitation: metals, such as stainless steel, aluminum alloys, and brass; glass and ceramic surfaces, such as glass, borosilicate glass and unglazed alumina; silica, such as silicon wafers; fired alumina; and the like. Further, the compositions of the invention either do not form noticeable emulsions with the displaced water or form only insignificant amounts of such emulsions.(see col. 2, lines 35-50)

Concerning the claimed industrial substrate, Nalewajek teaches the following:

27. A method for imparting soil repellency to a fabric comprising the steps of contacting the fabric with the composition of claim 5; and removing the solvent from the fabric.(see claim 27)

Concerning the claimed contaminants, Nalewajek teaches the following:

For purposes of evaluating the performance of the solvent-surfactant composition of the invention in the displacement of water, 35 mL of the solvent containing 500 ppm by weight of the surfactant prepared in Example 2 were placed in a 100 mL beaker fitted with a cooling coil. The solution was brought to a boil, the coiling coil confining the solvent vapor to the beaker. Duplicate 316 stainless steel coupons, wet-abraded to a water-break-free condition, were immersed in water and then into the boiling sample solution. The time required to displace the water from the coupon was recorded, a minimum observation time of 5 second being chosen.(see example 3)

Concerning the claimed industrial contaminants, Nalewajek teaches the following:

Art Unit: 1751

To a 5 L flask was added 225.7 g octylphenyl acid phosphate neutralized with triethylamine. 3300 g of CFC-113 were added and the mixture heated to reflux. 338.14 g of the intermediate prepared in Example 1 was added to the refluxing mixture. After three hours, the reaction was cooled to ambient temperature and 3 L water were added. The resulting organic layer was phase separated and the solvent removed under 100 mm vacuum to yield 504 g product.(see example 2)

Claims 19-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Milbrath (US6274543).

Concerning the dichloroethylene, Milbrath teaches the following:

(6) Trans-1,2-dichloroethylene (t-DCE), available from PPG Industries, Pittsburgh, Pa.(see col. 10, line 30)

Concerning the claimed alkoxy-substituted perfluoro compound and the claimed enhancement agent, Milbrath teaches the following:

Specific classes of useful non-flammable highly fluorinated compounds include highly fluorinated ethers (usually referred to as "hydrofluoroethers" or "HFEs"), highly fluorinated hydrocarbons (usually referred to as "hydrofluorocarbons" or "HFCs"), and highly fluorinated and partially chlorinated ethers (usually referred to as "hydrochlorofluoroethers" or "HCFEs").(see col. 2, lines 47-59)

Art Unit: 1751

Concerning the claimed highly fluorinated compound, Milbrath teaches the following:

TABLE 1

Formulation			
Blended Solvents	Application	Range	Compatible with:
HFE-7100	Silicone Solvent:	75-80	PMMA,
OXSOL .TM. 2000	Cleaning/Coating	10-22.5	Polycarbonate
t-DCE		2.5-10	
HFE-7100	Hydraulic Fluid	80-85	CIC, PMMA,
OXSOL .TM. 2000	Cleaning	10-17.5	Polycarbonate
t-DCE		2.5-10	
HFE-7100	Silicone Solvent:	68-70	PMMA,
HFX	Cleaning/Coating	16-20	Polycarbonate
t-DCE		10-14	
HFE-7100	Silicone Solvent:	57.5-72.5	Polycarbonate
HFX	Cleaning/Coating	10-25	
t-DCE		10-20	
HFE-7100	Hydraulic Fluid	55-67.5	CIC
HFX	Cleaning	7.5-25	
t-DCE		12.5-27.5	
HFE-7100	Hydraulic Fluid	57.5-67.5	CIC, Polycarbonate
HFX	Cleaning	12.5-25	
t-DCE		12.5-20	
HFE-7100	Silicone Solvent:	65-77.5	Polycarbonate
OXSOL .TM. 100	Cleaning/Coating	10-35	
t-DCE		0.5-15	
HFE-7100	Silicone Solvent:	65-77.5	PMMA,
OXSOL .TM. 100	Cleaning/Coating	25-35	Polycarbonate
t-DCE		0.5-2.5	
HFC	Hydraulic Fluid	70-90	CIC
OXSOL .TM. 2000	Cleaning	5-20	
t-DCE		0.5-15	
HFC	Hydraulic Fluid	70-90	CIC, Polycarbonate
OXSOL .TM. 2000	Cleaning	5-20	
t-DCE		7.5-15	
HFC	Hydraulic Fluid	50-90	CIC
HFX	Cleaning	5-35	
t-DCE		0.5-30	
HFC	Hydraulic Fluid	62.5-90	CIC, Polycarbonate
HFX	Cleaning	7.5-35	
t-DCE		0.5-2.5	
HFC	Hydraulic Fluid	62.5-75	CIC, Polycarbonate,
HFX	Cleaning	25-35	PMMA
t-DCE		0.5-2.5	
HFC	Hydraulic Fluid	75-87.5	CIC, PMMA
OXSOL .TM. 100	Cleaning	10-25	
t-DCE		0.5-2.5(see table 1)	

Art Unit: 1751

Concerning the claimed optical substrate and the claimed industrial substrate, Milbrath teaches the following:

The cleaning performance of each composition of the present invention tested in its ability to remove hydraulic fluid was evaluated by placing one drop of SKYDROL.TM. LD-4 hydraulic fluid onto a plain glass microscope slide near the top of the slide which had been set in a vertical position at a 45-60 degree angle from the horizontal direction. After the drop had spread to the bottom of the glass slide, 1.5 milliliters of the tested composition was squirted onto the slide with a 5-milliliter disposable pipet in an attempt to rinse off, or remove, the hydraulic fluid. The resulting appearance of the glass slide was recorded and the following rating system was assigned to these results.(see cols. 8-9)

Concerning the claimed aerosol form, Milbrath teaches the following:

The cleaning process of the present invention can be carried out by contacting a contaminated substrate with the non-flammable composition (here a cleaning composition). The compositions may be used in a liquid state, and any technique for "contacting" a substrate may be employed. For example, a liquid cleaning composition can be sprayed or brushed onto the soiled substrate, used to wet an absorbent cloth or towel for wiping a soiled surface, or the substrate can be immersed in a liquid composition. The composition may also be delivered to the substrate as an aerosol using a suitable propellant. Ultrasonic energy and/or agitation may also be used

Art Unit: 1751

to facilitate the cleaning. Various different solvent cleaning techniques are described by B. N. Ellis in Cleaning and Contamination of Electronics Components and Assemblies, Electrochemical Publications Limited, Ayr, Scotland, pages 182-194 (1986).(see col. 7, lines 7-22)

Concerning the claimed contaminants and the claimed industrial contaminants, Milbrath teaches the following:

The described cleaning process can be used to dissolve or remove most contaminants from the surface of a substrate. For example, materials such as light hydrocarbon contaminants; higher molecular weight hydrocarbon contaminants such as mineral oils and greases; fluorocarbon contaminants such as perfluoropolyethers, bromotrifluoroethylene oligomers (gyroscope fluids), and chlorotrifluoroethylene oligomers (hydraulic fluids and lubricants); silicone oils and greases; solder fluxes; particulates; and other contaminants encountered in precision, electronic, metal, and medical device cleaning can be removed.(see col. 7, lines 44-55)

Claims 19-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Merchant (US5824634).

Concerning the dichloroethylene, Merchant teaches the following:

The circuit board cleaning procedure of Example 3 was repeated with a cleaning composition which is a ternary azeotrope of 64% by weight

Art Unit: 1751

1,1,1,2,3,4,4,5,5,5-decafluoropentane, 35% by weight

trans-1,2-dichloroethylene and 1.0% by weight ethanol (B.P. 35.degree.

C.). Following cleaning, the circuit boards had no visible residue.(see example 4)

Concerning the claimed alkoxy-substituted perfluoro compound and the claimed highly fluorinated compound, Merchant teaches the following:

Representative acyclic aliphatic hydrofluorocarbons that can be used as a component of the cleaning composition include

1,1,2,2,3,3,4,4-octafluorobutane, 1,1,1,2,2,3,5,5,5-nonafluoropentane,

1,1,1,2,2,3,4,5,5,5-decafluoropentane,

1,1,1,2,2,4,5,5,5-nonafluoropentane, 1,1,1,2,2,3,3,5,5,5-decafluoropentane

, 1,1,1,4,4,5,5,5-octafluoro-2-trifluoromethylpentane,

1,1,1,3,4,4,5,5,5-nonafluoro-2-trifluoromethylpentane,

1,1,1,2,2,3,3,4,5,6,6,6-dodecafluorohexane,

1,1,1,2,2,4,4,5,5,5-decafluoropentane, 1,1,1,2,3,3,4,4-octafluorobutane,

1,1,1,2,2,3,3,4,4,5,5-undecafluoropentane,

1,1,1,2,3,3,4,4-octafluoro-2-trifluoromethylbutane,

1,1,1,3,3,4,4,4-octafluoro-2-trifluoromethylbutane,

1,1,2,2,3,3,3,4,4,5,5-decafluoropentane,

1,1,1,2,4,4,4-heptafluoro-2-trifluoromethylbutane,

1,1,1,3,4,4,4-heptafluoro-2-trifluoromethylbutane,

1,1,2,2,3,3,3,4,4,5-nonafluoropentane, 1,1,1,2,3,3,5,5,5-nonafluoropentane,

1,1,1,3,4,4,4-hexafluoro-2-trifluoromethylbutane,

Art Unit: 1751

1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluorohexane,
1,1,1,3,3,4,4,5,5,5-decafluoro-2-trifluoromethylpentane,
1,1,2,2,3,3,4,4,5,5,6,6-dodecafluorohexane,
1,1,1,2,3,4,5,5,5-nonafluoro-2-trifluoromethylpentane and
1,1,1,4,4,4-hexafluoro-2,3-bis(trifluoromethyl)butane.(see cols. 4-5)

Concerning the claimed enhancement agent, Merchant teaches the following:

The co-solvents used in the compositions of this invention have a boiling point at atmospheric pressure of from 20.degree. C.-105.degree. C. The co-solvents can be alcohols having 1-4 carbon atoms, for example methyl alcohol, ethyl alcohol, n-propyl alcohol, isopropyl alcohol, sec.-butyl alcohol and tert.-butyl alcohol. Compositions containing these lower aliphatic alcohols are especially useful for removing flux residues from circuit boards. Esters that can be used in the composition that contain 3-6 carbon atoms include methyl acetate, methyl butyrate, ethyl acetate, ethyl propionate, propyl acetate, butyl formate, tert.butyl acetate.

Ethers containing 2-6 carbon atoms are suitable co-solvents and include diethyl ether, methyl ethyl ether, methyl propyl ether, dipropyl ether, ethyl butyl ether. Ketones having 3-6 carbon atoms can be used.

Representative ketones include acetone, methyl ethyl ketone, diethyl ketone, methyl-n-propyl ketone. Chlorinated hydrocarbons, optionally containing fluorine, having 1-4 carbon atoms are generally useful for removing grease and oil from machine parts. Representative halogenated

Art Unit: 1751

hydrocarbons include 1,2-dichloroethylene, 1,1-dichloroethane, 1,2-dichloroethane, dichloromethane, chloroform, butyl chloride, 1,1-dichlorotrifluoroethane, 1,1-dichloro-1-fluoroethane and 1,1-dichloro-2,2,3,3,3-pentafluoropropane, 1,3-dichloro-1,2,2,3,3-pentafluoropropane, and 2,2-dichloro-1,1,3,3,3-pentafluoropropane. Generally when alcohols are used with the acyclic aliphatic hydrofluorocarbon, the alcohols are added in amounts from about 2-15 weight percent. When the co-solvent is an ester or an ether, generally the amount of co-solvent added to the cleaning composition is from about 2-15 weight percent and 5-20 weight percent, respectively. Ketones are usually added as co-solvent to the aliphatic hydrofluorocarbon in amounts of from about 5-20 weight percent and usually chlorinated hydrocarbons are added to the aliphatic hydrofluorocarbon in amounts of from about 10-45 weight percent.(see col. 5, lines 8-42)

Concerning the claimed substrate, claimed optical substrate and the claimed industrial substrate, Merchant teaches the following:

The surface of the substrates are cleaned by treating the surface by, for example, immersion, spraying or wiping the surface, with the cleaning composition. The compositions of this invention are effective cleaning agents. They are well-suited for removal of solder flux residue from printed circuit boards; oils and greases from metal, ceramic, glass, or plastic parts; and water from wetted articles such as metal parts or

Art Unit: 1751

printed circuit boards. In addition, the compositions of this invention have low toxicity. Since the compositions of the present invention do not contain chlorofluorocarbons, they have a significantly reduced potential to deplete the stratospheric ozone layer. In addition, since the fluorocarbon portion of these cleaning compositions contain hydrogen (that is, are hydrofluorocarbons, HFCs), they have reduced atmospheric lifetimes relative to perfluorinated compounds and thus have a reduced global warming potential relative to perfluorinated compounds.(see col. 2, lines 20-36)

Concerning the claimed contaminants, Merchant teaches the following:

Oil #3--Texaco soluble oil D, a water-soluble cutting oil, available from Texaco Oil Co., Houston, Tex.,(see example 8)

Concerning the claimed industrial contaminants, Merchant teaches the following:

Accordingly, there is a need in the industry for effective cleaning agents for removing oils, grease and abrasives, fluxes, water, etc., which are nonflammable, possess low toxicity and are degradable in the lower atmosphere.(see col. 1, lines 58-63)

Concerning the exemplified cosolvents, Merchant teaches the following:

Three cleaning compositions were prepared by mixing 1,1,1,2,3,4,4,5,5,5-decafluoropentane (43-10 mee) with methanol, ethanol and isopropanol in the proportions tabulated below. These compositions are azeotropes that have the boiling points indicated in the following Table.(see example 2)

Art Unit: 1751

Claims 19-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Owens (US6030934).

Concerning the dichloroethylene, Owens teaches the following:

2. The azeotropic composition of claim 1 consisting essentially of
77.6,+-0.1 weight percent n-C.sub.3 F.sub.7 --OCH.sub.3 and 22.4,+-0.1
weight percent trans-1,2-dichloroethylene and having a boiling point of
29.5.degree. C.,+-1.degree. C. at a pressure of 736.0 mm Hg.(see claim 2)

Concerning the claimed alkoxy-substituted perfluoro compound, Owens teaches the following:

GLC analysis showed the product to be composed of some unidentified low
boiling materials (5%) along with the desired product (90%) and some
higher boiling hydride containing hydrofluoroethers. Fractional
distillation through a 50 plate Oldershalk column provided
1-methoxyperfluoropropane(500 g), bp 33.degree. C., with an assay greater
than 99.8% by GLC analysis. Structural verification was done using ¹⁹F
NMR.(see col. 11, lines 45-50)

Concerning the claimed highly fluorinated compound, Owens teaches the following:

FIG. 1 represents a vapor-liquid equilibrium curve for a
methoxy-perfluoropropane/trans1,2-dichloroethylene system at atmospheric
pressure.(see fig. 1)

Concerning the claimed enhancement agent, Owens teaches the following:

Suitable alkylating agents for use in the preparation include dimethyl
sulfate, methyl iodide, methyl p-toluenesulfonate, methyl

Art Unit: 1751

perfluoromethanesulfonate and the like. Suitable polar, aprotic solvents include acyclic ethers such as diethyl ether, ethylene glycol dimethyl ether, and diethylene glycol dimethyl ether; carboxylic acid esters such as methyl formate, ethyl formate, methyl acetate, diethyl carbonate, propylene carbonate, and ethylene carbonate; alkyl nitriles such as acetonitrile; alkyl amides such as N,N-dimethylformamide, N,N-diethylformamide, and N-methylpyrrolidone; alkyl sulfoxides such as dimethyl sulfoxide; alkyl sulfones such as dimethylsulfone, tetramethylene sulfone, and other sulfolanes; oxazolidones such as N-methyl-2-oxazolidone; and mixtures thereof.(see col. 5, lines 35-48)

Concerning the claimed substrate, claimed contaminants and the claimed industrial contaminants, Owens teaches the following:

7. A process according to claim 6 wherein said solid surface is a printed circuit board contaminated with flux and flux residues.(see claim 7)

Concerning the claimed optical substrate and the claimed industrial substrate, Owens teaches the following:

Both organic and inorganic substrates can be cleaned by the process of the invention. Representative examples of the substrates include metals; ceramics; glass; polymers such as: polycarbonate, polystyrene and acrylonitrile-butadiene-styrene copolymer; natural fibers (and fabrics derived therefrom) such as: cotton, silk, linen, wool, ramie; fur; leather and suede; synthetic fibers (and fabrics derived therefrom) such as:

Art Unit: 1751

polyester, rayon, acrylics, nylon, polyolefin, acetates, triacetates and blends thereof; fabrics comprising a blend of natural and synthetic fibers; and composites of the foregoing materials. The process is especially useful in the precision cleaning of electronic components (e.g., circuit boards), optical or magnetic media, and medical devices and medical articles such as syringes, surgical equipment, implantable devices and prostheses.(see col, 8, lines 42-58)

Concerning the claimed aerosol form, Owens teaches the following:

Aerosol products have employed both individual halocarbons and halocarbon blends as propellant systems. Halocarbons have also been used both as solvents and propellant vapor pressure attenuators, in aerosol systems.(see col. 1, lines 43-48)

Concerning the exemplified cosolvents, Owens teaches the following:

(I) a composition consisting essentially of 95.8-96.2 weight percent n-C.sub.3 F.sub.7 --OCH.sub.3 and 3.8-4.2 weight percent methanol and having a boiling point of 29.0.degree. C..+-1.degree. C. at a pressure of 728.5 mm Hg;(see col. 7)

Claims 19-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Flynn (US6291417).

Concerning the dichloroethylene, Flynn teaches the following:

Various properties were measured for C.sub.4 F.sub.9 OCH.sub.3, CHClFCF.sub.2 OCH.sub.3, and blends of each ether compound with co-solvent, trans-1,2-dichloroethylene (hereinafter, t-DCE) or n-butyl

Art Unit: 1751

bromide, at various weight ratios. The results of these measurements are shown in Tables 16 and 17 below.(see cols. 28-29)

Concerning the claimed alkoxy-substituted perfluoro compound, Flynn teaches the following:

This invention relates to cleaning compositions comprising at least one partially-fluorinated ether compound and to processes for removing contaminants from substrate surfaces using such compositions. In another aspect, this invention relates to certain novel partially-fluorinated ether compounds. In yet another aspect, this invention relates to coating compositions comprising at least one partially-fluorinated ether compound and to processes for depositing coatings on substrate surfaces using such compositions.(see col. 1, lines 9-18)

Concerning the claimed highly fluorinated compound and the exemplified cosolvents, Flynn teaches the following:

Representative examples of co-solvents which can be used in the cleaning composition include methanol, ethanol, isopropanol, t-butyl alcohol, methyl t-butyl ether, methyl t-amyl ether, 1,2-dimethoxyethane, cyclohexane, 2,2,4-trimethylpentane, n-decane, terpenes (e.g., α -pinene, camphene, and limonene), trans-1,2-dichloroethylene, cis-1,2-dichloroethylene, methylcyclopentane, decalin, methyl decanoate, t-butyl acetate, ethyl acetate, diethyl phthalate, 2-butanone, methyl isobutyl ketone, naphthalene, toluene, p-chlorobenzotrifluoride, trifluorotoluene, bis(trifluoromethyl)benzenes, hexamethyl disiloxane,

Art Unit: 1751

octamethyl trisiloxane, perfluorohexane, perfluoroheptane,
perfluorooctane, perfluorotributylamine, perfluoro-N-methyl morpholine,
perfluoro-2-butyl oxacyclopentane, methylene chloride, chlorocyclohexane,
1-chlorobutane, 1,1-dichloro-1-fluoroethane,
1,1,1-trifluoro-2,2-dichloroethane,
1,1,1,2,2-pentafluoro-3,3-dichloropropane,
1,1,2,2,3-pentafluoro-1,3-dichloropropane, 2,3-dihydroperfluoropentane,
1,1,1,2,2,4-hexafluorobutane,
1-trifluoromethyl-1,2,2-trifluorocyclobutane,
3-methyl-1,1,2,2-tetrafluorocyclobutane, 1-hydropentadecafluoroheptane,
and mixtures thereof.(see col. 10, lines 12-33)

Concerning the claimed enhancement agent, Flynn teaches the following:

9. The process of claim 1 wherein said co-solvent is selected from the group consisting of alcohols, ethers, alkanes, alkenes, haloalkenes, perfluorocarbons, perfluorinated tertiary amines, perfluoroethers, cycloalkanes, esters, ketones, aromatics, haloaromatics, siloxanes, hydrochlorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, and mixtures thereof.(see claim 9)

Concerning the claimed aerosol form, Flynn teaches the following:

The deposition process of the invention can be carried out by applying the coating composition to a substrate by any conventional technique. For example, the composition can be brushed or sprayed (e.g., as an aerosol)

Art Unit: 1751

onto the substrate, or the substrate can be spin-coated. Preferably, the substrate is coated by immersion in the composition. Immersion can be carried out at any suitable temperature and can be maintained for any convenient length of time. If the substrate is a tubing, such as a catheter, and it is desired to ensure that the composition coats the lumen wall, it may be advantageous to draw the composition into the lumen by the application of reduced pressure.(see col. 11, lines 24-35)

Concerning the claimed contaminants, Flynn teaches the following:

The data show that the alkoxy-substituted perfluorocompounds very effectively removed the perfluoropolyether oil from the surface of the coupon. This indicates that the perfluorocompounds can function well as cleaning solvents for the removal of halogenated compounds such as halogenated oils and greases.(see col. 23, lines 40-45)

Concerning the claimed industrial contaminants, Flynn teaches the following:

The ability of alkoxy-substituted perfluorocompounds to function as a rinse agent in a co-solvent cleaning process was evaluated. The above-described aluminum coupon was coated with solder flux (available from Alpha Metals as Alpha 611 rosin, mildly activated flux) by immersing the coupon into a flux-filled beaker. The flux-coated coupon was then dried using a forced air convection drier. The initial amount of the flux on the coupon was determined by weighing it on an analytical balance to the nearest 0.1 mg. The coupon was immersed in a container of a mixed solvating agent

Art Unit: 1751

comprising approximately 50% methyl decanoate and 50% dipropylene glycol di-n-butyl ether and was sonicated for 1 minute at approximately 55.degree. C. The coupon was then immersed for 30 seconds into alkoxy-substituted perfluorocompound which had been heated to its boiling point. The coupon was weighed again, and the results were recorded in Table 5 below as percent oil removed from the coupon.(see examples 14-16)

Claims 19-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Miller (US6770614).

Concerning the dichloroethylene, Miller teaches the following:

3. The cleaning composition according to claim 1, wherein the halogenated hydrocarbon is selected from the group consisting of trans-1,2-dichloroethylene, trichloroethylene, perchloroethylene or n-propyl bromide.(see claim 3)

Concerning the claimed alkoxy-substituted perfluoro compound, Miller teaches the following:

In addition to providing a cleaning composition with favorable properties, the invention also provides a method for cleaning a soiled surface of a substrate, such as an electronic or electrical component. However, the method would be appropriate for cleaning the soiled surface of any type of substrate. The method comprises applying to the surface a cleaning composition comprising at least one halogenated, saturated or unsaturated hydrocarbon other than cis-1,2-dichloroethylene; at least one fluorinated,

Art Unit: 1751

saturated or unsaturated hydrocarbon having the formula $C_{n-6}H_{n-6}$ or $C_{n-9}H_{n-9}$ wherein $3 \leq n \leq 6$, $0 \leq m \leq 9$ and $p \geq 5$; at least one fluorinated saturated or unsaturated ether having the formula $C_aH_bO_cF_d$, wherein $3 \leq a \leq 6$, $0 \leq b \leq 9$, $c \geq 1$, and $d \geq 5$; methylal; and at least one simple alcohol; and removing the composition with the soil from the surface. (see col. 10, lines 15-27)

Concerning the claimed highly fluorinated compound, Miller teaches the following:

4. The cleaning composition according to claim 1, wherein the fluorinated hydrocarbon is selected from the group consisting of 1,1,1,3,3-pentafluorobutane, 1,1,1,3,3-pentafluoropropane and 1,1,1,2,3,4,4,5,5,5-decafluoropentane. (see claim 4)

Concerning the claimed enhancement agent, Miller teaches the following:

5. The cleaning composition according to claim 1, wherein the fluorinated ether is selected from the group consisting of methyl nonafluorobutyl ether and ethyl nonafluoroisobutyl ether. (see claim 5)

Concerning the claimed substrate, Miller teaches the following:

19. The method according to claim 18, wherein the substrate is selected from the group consisting of electronic and electrical components. (see claim 19)

Concerning the claimed industrial substrate, Miller teaches the following:

Furthermore, cleaning compositions may be evaluated using the Bellcore Stressed Plastic Test (also known as the Bellcore Stress Cracking

Art Unit: 1751

Procedure) on Lexan.RTM. Grade 141 (polycarbonate injection molded bars, available from GE Plastics; 2.5".times.0.5".times.0.125"), Noryl.RTM. Grade SEI (modified polyphenylene ether, available from DuPont, Wilmington, Del.; 2.5".times.0.5".times.0.125") and Cylolac.RTM. Grade T (acrylonitrile-butadiene styrene, available from Meta Spec, San Antonio, Tex.; 2.5".times.0.1".times.0.125"). Details regarding the Bellcore Stress Cracking Procedure are available from Bell Communications Research, Florham Park, N.J. as test method TR-620-23352-84-3. In essence, a candidate cleaner is applied to a sample of plastic (having a stress applied thereon by heating and then bending the plastic) and the plastic is monitored for cracking and crazing over a 24-hour period. If a candidate composition does not harm the plastic, then it passes the Bellcore Stressed Plastic Test.(see col. 8, lines 1-18)

Concerning the claimed aerosol form, Miller teaches the following:

The cleaning compositions are preferably packaged in aerosol cans. As previously explained, the inventive precision cleaning compositions may be used advantageously for the industrial repair and maintenance market, and thus it is desirable that the finished product be packaged in a container that is convenient to transport and use. An aerosol can fulfils both of these requirements. Technologies for producing aerosol cans of a cleaning composition are well known in the art and need not be repeated here. As previously explained, it is desirable to select a proper propellant to

Art Unit: 1751

maximize the cleaning ability of the cleaning composition, which in the present invention is preferably a compressed gas, more preferably carbon dioxide. Aspects of the aerosol can, such as the lining, are not critical.

However, it is preferred that the gasket(s) for the aerosol valve be compatible with the products' components. When packaged as aerosols, the inventive compositions have been found to be stable for long periods of time, and weight loss over time has been found to be in a range that is acceptable to those skilled in the art.(see col. 5, lines 39-57)

Concerning the claimed contaminants and the claimed industrial contaminants, Miller teaches the following:

The ability of a composition to clean soils such as brake soil and moly grease may be assessed as follows. Brake soil is applied to one panel by brushing an even coating of diluted brake soil (carbon black mixed with perchloroethylene) onto a 3".times.5" Q-panel until the surface is totally covered. The soiled panel is then hung in a 105.degree. C. oven for 1 hour prior to testing. Moly grease is applied to another panel by rolling an even coating of a 50/50 moly grease/oil mixture onto a 6".times.12" steel panel using a grooved spreader bar. The soiled panel is hung on a rack with a bent paper clip prior to testing. Both soiled panels are then tested as follows. The panels are leaned upright in a small tray to catch the excess cleaner. An aerosol can containing the candidate cleaning composition is positioned six inches from the panel, and the cleaner is

Art Unit: 1751

sprayed for 5 seconds with the spray directed toward the center of the panel. The amount of material drained from the panel is qualitatively evaluated by a trained technician to visually determine the percentage of the soil that is removed.(see col. 7, lines 3-22)

Concerning the exemplified cosolvents, Miller teaches the following:

6. The cleaning composition according to claim 1, wherein the alcohol is selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, sec-butanol, and t-butanol.(see claim 6)

Claims 19-33 are rejected under 35 U.S.C. 102(b) as being anticipated by

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